And the committee are of opinion, that this oil will ſupply the place of olive oil for the above, and many other purpoſes, and may therefore be looked upon as a valuable diſcovery to America.

Doctor Bond, at the ſame time, produced a ſample of oil, made from the cotton ſeeds, and ſent by the ſame gentleman, of which he gives this account: This is the ol. bombac. or oil of cotton ſeed, made in the ſame manner as the above, one buſhel and a half of which yield nine pints of oil, and I have been informed it is ſucceſsfully uſed in the Weſt-Indies for the cholic.

An Eſſay on the expreſſing of OIL, *from* SUN-FLOWER SEED, *&c. By Dr.* J. Morgan.

THE grinding of the ſun flower ſeeds, and expreſſing of oil from the ſame, is a manufacture, which, as far as can be yet learned, was firſt begun among the Moravian brethren at Bethlehem, and reflects honour upon them, whilſt it affords the public a new ſubſtance, very beneficial in a variety of purpoſes, but more eſpecially, as it may ſerve for a ſallad oil, and for other uſes of diet and medicine, in the place of olive oil.

From experiments already made at Bethlehem, it is found that a buſhel of the ſun-flower ſeed will yield, on expreſſion, near a gallon of mild oil. The gentleman, who is appointed by the community there to ſuperintend their mills, deſigns, as we are informed, to purſue a further courſe of experiments on this ſubject, the reſult of which, we hope, will be communicated to this Society.

Our correſpondent at Lancaſter informs the Society, that ſome perſons in the neighbourhood of that place, have alſo expreſſed a quantity of oil from the ſeeds of the ſun-flower. His account is as follows.

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" THE perſon, who has raiſed the greateſt quantity of the " ſun-flowers with us, informs me, that one hundred plants, " ſet about three feet diſtance from each other, in the ſame " manner Indian corn is commonly planted, will produce one " buſhel of ſeed, without any other trouble, than that of " putting the ſeed into the ground, from which he thinks " one gallon of oil may be made. I obſerved the land, on " which he planted the ſun flowers, to be of the middling " ſort, and that he took no pains to hill them, or even to " looſen the ground about them, which from my own obſer- " vation on ſome planted in a neighbour's garden, I take to " be of conſiderable uſe.

" As the ſun-flower is a plant of great increaſe, and re- " quires much nouriſhment, hilling does not ſeem ſo good a " method as that of ſetting the ſeed or plant in a hole, and " when the plant is about a yard high, to throw in the mould " round the ſtalk, ſo that the ſurface of the ground may be " even about it. By an eſtimate made it appears, that one " acre of land will yield to the planter between forty and fifty " buſhels of ſeed, which will produce as many gallons of oil. " The proceſs for making or extracting the oil, is the ſame as " that of making linſeed oil, which I make no doubt the So- " ciety is acquainted with, and therefore ſhall not trouble you " with it."

THE ſucceſs attending the trials already made, give the greateſt encouragement to proſecute this uſeful diſcovery. And as the ſeeds of the ſun flower are at this time nearly ripe, and in a proper ſtate for extracting the oil from them, it may be of ſervice to lay theſe facts before the public. Such as may have an inclination to make trials on this ſubject, and are not at preſent furniſhed with a ſufficient quantity of ſeed for preſſing out an oil, may now ſupply themſelves with enough to plant for making experiments the enſuing year.

FOR the information of thoſe, who have both opportunity and inclination to extend the enquiry, and render this a valuable branch of buſineſs, but are not acquainted with the gene-

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ral principles, upon which oil is obtained by expreſſion from vegetable ſubſtances, it may be proper to obſerve, that the kernels of fruits, ſuch as walnuts, hickory nuts, filberts, almonds, peaches, &c. and the ſeeds of many plants, as muſtard, rape, poppy, flax, ſun-flower, &c. contain a large portion of mild oil. In order to obtain the oil, the kernels, or ſeeds are commonly rubbed to powder, or ground in mills. They are then put into a ſtrong bag, made of canvas, or woollen cloth, and committed to a preſs between iron plates, by which the oil is ſqueezed out, and is received or conducted into a proper veſſel to collect it. The plates of the preſs are often heated, either in boiling water, or before the fire. Many heat the maſh itſelf in a large iron pot, ſtirring it about with a ſtick or piece of wood, to prevent its burning, which, when it happens, greatly injures the oil, and gives it a burnt ſmell and taſte, or diſpoſes it to become rancid in a ſhort time. When the oil is drawn without the aſſiſtance of heat, it is known by the name of cold drawn oil, and is more valuable, than when heat is uſed, but it is not obtained in the ſame quantity. It is milder, and may be kept longer without ſpoiling.

In a cold ſeaſon of the year, a certain degree of heat is abſolutely neceſſary. But if the oil is deſigned for aliment or medicine, the plates of the preſs ſhould be heated in boiling water only. When the oil is intended for other uſes, the plates may be made hotter, as heat expedites the ſeparation of the oil, and gives a greater produce, but then care ſhould be taken not to injure the ſubject by burning.

Sometimes the ſubject, when ground, appears almoſt like a dry powder. It is then ſaid to be meagre, and requires to be expoſed to the vapours of boiling water, which is done either by tying it up in a bag, or putting it into a ſieve, and placing it over the ſteam. By this impregnation, it will yield its oil more readily, and in greater quantity. The oil may be eaſily freed from any water that may happen to be preſſed out with it, as a ſpontaneous ſeparation between them will take place on ſtanding for ſome time.

For the encouragement of thoſe, who may chooſe to improve this ſubject, it may be proper to obſerve, that all the oils, from whatever vegetable ſubſtances they are drawn, when obtained by expreſſion with due caution, agree in their general qualities, and are conſtantly mild, even tho' they are obtained from very acrid ſubſtances. Thus the expreſſed oil of muſtard ſeed is, when freſh, as mild as that of olives, and the bitter almond, or peach kernel, affords an oil, by expreſſion, as mild as that of ſweet almonds. It is upon this principle, that the ſun flower oil may prove equally valuable with the beſt Florence oil, for diet or medicine. For every expreſſed oil, when pure and freſh, is void of acrimony, and free from any particular taſte or ſmell.

Besides the mild oil juſt mentioned, ſome ſubſtances contain another kind of oil, called its eſſential oil, a part of which may be drawn off with the mild expreſſed oil, ſo called, and impart its ſmell or taſte to that oil. It is called eſſential oil, from its yielding the particular odour of the vegetable, or part of the plant, from which it was obtained; it is pungent to the taſte, and ſoluble in ſpirits of wine, which the other is not. They may therefore be eaſily diſtinguiſhed from each other.

The oil of ſweet almonds, and the oil of olives, being pure unctuous expreſſed oils, not ſoluble in ſpirits of wine, but mild to the taſte, and void of odour, very ſoft, emollient and lenitive, are chiefly uſed in medicine and diet. And the reaſon why the oil of olives, in particular, is preferred, is becauſe it is leſs expenſive, and will keep a much longer time without becoming rancid.

Perhaps, on trial, the ſun-flower ſeeds may be found to contain an oil that will anſwer the like good purpoſes with the ſallad and medicinal oil, now in uſe. If ſo it will have this advantage over that of almonds or olives, that it is a native of the country, may be always had freſh, and at a ſmall expence. Whereas the others are the produce of diſtant countries, bear a high price, and are often adulterated on that account; or being kept a long time, they loſe their mild quality, and become rancid and acrimonious.

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THE practicableneſs of getting oil among ourſelves at a moderate expence, and the importance of uſing it freſh, together with the probable uſes of ſun-flower oil for varniſhes, for the baſis of ointments, and for mixing of paints, as well as other purpoſes to be anſwered by oils in general, claim our attention to this ſubject, and encourage further trials of the like kind.

BEFORE we quit this ſubject, it may not be amiſs to mention, that caſtor oil is juſtly celebrated for its medicinal qualities: The plant, from the ſeeds of which it is got, may be eaſily cultivated in this country, and the encreaſe of it is very great in a ſhort time; might it not then be worth the attention of our farmers to propage this plant, for the ſake of its oil? We would juſt ſuggeſt, that perhaps it might be worth while to try whether the ſeeds of ſumach, with which this country abounds, or of the mullen, which grows in old fields, and bears a great quantity of ſeed, would not yield, by expreſſion a valuable oil for medicine, or other purpoſes.

Mr. JOHN MOREL'S *Letter, with a Keg of* BENE SEED. *Read before the Society, May* 20, 1769.

Savannah, 5th May, 1769.

To Mr. CHARLES THOMSON, *Secretary of the American Philoſophical Society, at Philadelphia.*

SIR,

I SEND you a ſmall keg of Bene or Bene Seed, which you will pleaſe to preſent to your Society for their inſpection. This ſeed makes oil equal in quality to Florence, and ſome ſay preferable. Some ſay one hundred weight of ſeed will produce ninety pounds of oil, others ſay leſs, be that as it will, it certainly makes very fine oil, and produces amazingly. If it is put to the trial, care ſhould be taken to have the preſs well cleaned, ſo as leave no tincture from what may have been